

E 1.28: SOLAR / 1039-79/04 ✓

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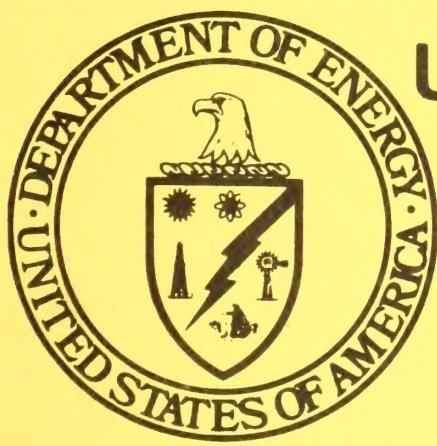
SOLAR/1039-79/06

Monthly Performance Report

SADDLE HILL TRUST

LOT 73

JUNE 1979



U.S. Department of Energy

National Solar Heating and
Cooling Demonstration Program

National Solar Data Program

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MONTHLY PERFORMANCE REPORT

SADDLE HILL TRUST
LOT 73

JUNE 1979

I. SYSTEM DESCRIPTION

Saddle Hill Trust Lot 73 is a single-family residence in Medway, Massachusetts. Solar energy is used for preheating incoming city water. The system has an array of flat-plate collectors with a gross area of 45 square feet. The array faces south at an angle of 45 degrees to the horizontal. A 60 percent glycerol solution is used as the medium for delivering solar energy from the collector array to storage. Water is the transport medium that delivers solar energy to storage and to the domestic-hot-water (DHW) heater. Solar energy is stored in the basement in an 80-gallon preheat tank. This preheated city water is supplied, on demand, to a conventional 40-gallon DHW tank. When solar energy is insufficient to satisfy the hot water requirements, the gas-driven DHW heater provides auxiliary energy for water heating. The system, shown schematically in Figure 1, has two modes of solar operation.

Mode 1 - Collector-to-Storage: This mode activates when a 40°F temperature difference exists between the collector and the preheat tank. The solar pump is on. This mode continues operating until the temperature difference drops to 20°F.

Mode 2 - Storage-to-DHW Tank: This mode activates when there is a demand for hot water. Hot water from the top of the preheat tank is transferred to the DHW tank to replace the amount removed. Simultaneously, city water is automatically supplied to the preheat tank.

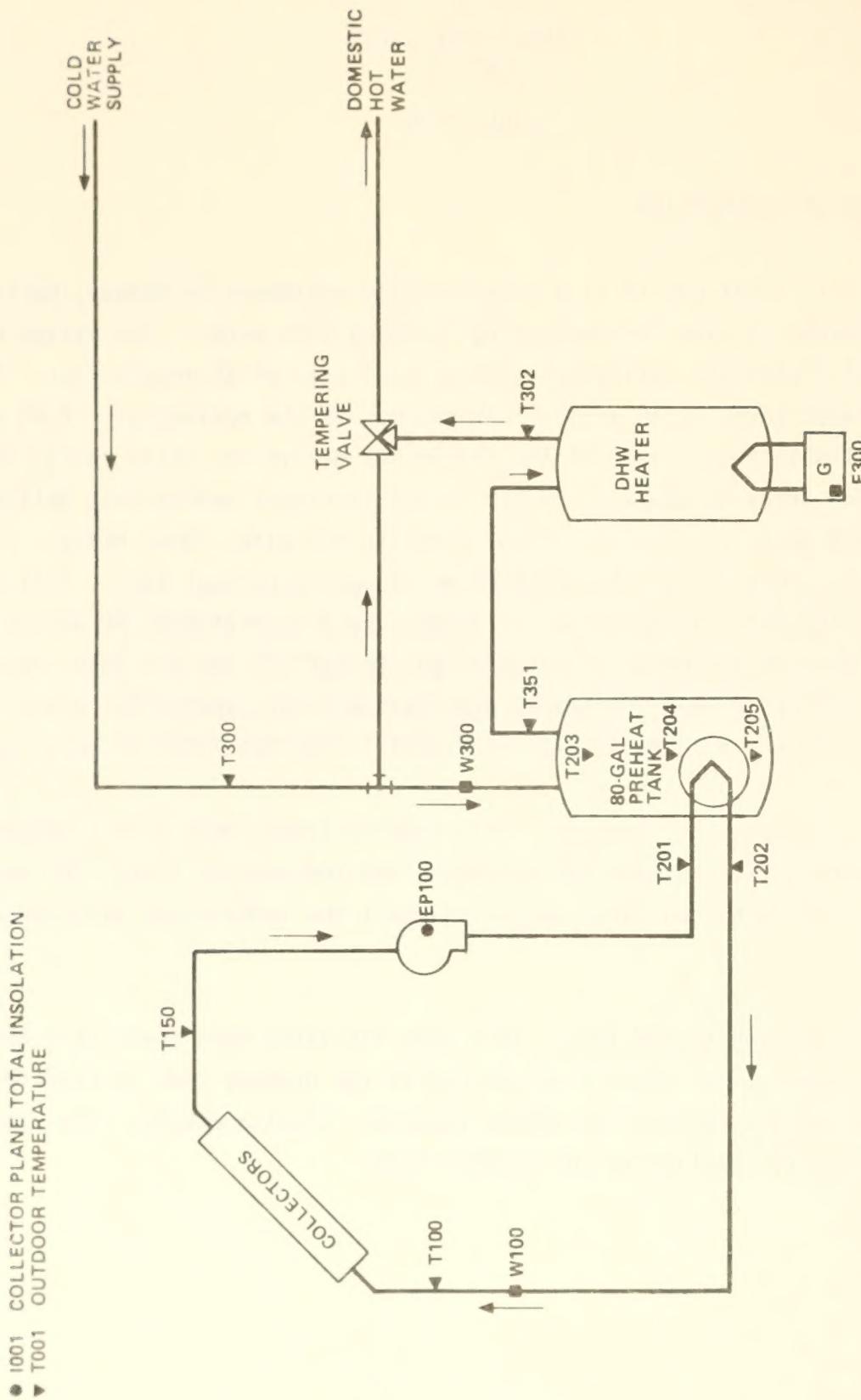


Figure 1. SADDLE HILL TRUST, LOT NO. 73 SOLAR ENERGY SYSTEM SCHEMATIC

II. PERFORMANCE EVALUATION

INTRODUCTION

The site was occupied in June and the solar energy system operated continuously during the month. Total solar energy collected was 1.4 million Btu and the total solar energy used was 0.87 million Btu or 62 percent of the collected energy. Stored energy increased by 0.03 million Btu and storage losses amounted to 0.39 million Btu. Solar energy satisfied 77 percent of the DHW requirements. The solar energy system incurred an electrical expense of 0.19 million Btu and provided a fossil fuel savings of 1.4 million Btu.

WEATHER CONDITIONS

During the month, total incident solar energy on the collector array was 2.4 million Btu for a daily average of 1757 Btu per square foot. This was above the estimated average daily solar radiation for this geographical area during June of 1513 Btu per square foot for a south-facing plane with a tilt of 45 degrees to the horizontal. The average ambient temperature during June was 67°F and was close to the long-term average for June of 68°F.

THERMAL PERFORMANCE

System - During June the solar energy system performed approximately the same as expected. The expected performance was determined from a modified f-chart analysis using measured weather and subsystem loads as input. Solar energy used by the system was estimated by assuming that all energy collected would be applied to the load. Actual solar energy used was 0.87 million Btu versus an estimated 0.98 million Btu. System total solar fraction was 77 percent versus an estimated 87 percent.

Collector - The total incident solar radiation on the collector array for the month of June was 2.4 million Btu. During the period the collector loop was operating, the total insolatation amounted to 2.2 million Btu. The total collected solar energy for the month of June was 1.4 million Btu, resulting in a collector array efficiency of 59 percent, based on total incident insolatation. Solar energy delivered from the collector array to storage was 1.3 million Btu. Energy loss during transfer from the collector array to storage was 0.12 million Btu. This loss represented 9 percent of the energy collected. Operating energy required by the collector loop was 0.19 million Btu.

Storage - Solar energy delivered to storage was 1.3 million Btu. There were 0.87 million Btu delivered from storage to the DHW. Energy loss from storage was 0.39 million Btu. This loss represented 30 percent of the energy delivered to storage. The storage efficiency was 70 percent: This is calculated as the ratio of the sum of the energy removed from storage and the change in stored energy, to the energy delivered to storage. The average storage temperature for the month was 106°F.

DHW Load - The DHW subsystem consumed 0.87 million Btu of solar energy and 0.43 million Btu of auxiliary fossil fuel energy to satisfy a hot water load of 1.1 million Btu. The solar fraction of this load was 77 percent. A daily average of 68 gallons of DHW was consumed at an average temperature of 126°F delivered from the tank.

OBSERVATIONS

There were no special observations to report this month.

ENERGY SAVINGS

The solar energy system provided a fossil fuel energy savings of 1.4 million Btu, while incurring an electrical energy expense of 0.19 million Btu.

III. ACTION STATUS

No action is required at this time.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARYSITE: SADDLE HILLS TRUST LOT #73, MEDWAY, MA 02053
REPORT PERIOD: JUNE 1979

SITE/SYSTEM DESCRIPTION:

THE SADDLE HILL TRUST, LOT #73 SOLAR ENERGY SYSTEM FURNISHES HOT WATER YEAR-ROUND TO A SINGLE FAMILY DWELLING. THE COLLECTOR IS A TWO-PANEL LIQUID COLLECTOR. STORAGE SPACE IS AN 80 GALLON WATER TANK. AUXILIARY HOT WATER IS PROVIDED BY A GAS HOT WATER HEATER.

GENERAL SITE DATA:
INCIDENT SOLAR ENERGY

COLLECTED SOLAR ENERGY

AVERAGE AMBIENT TEMPERATURE
AVERAGE BUILDING TEMPERATURE
ECSS SOLAR CONVERSION EFFICIENCY
ECSS OPERATING ENERGY
TOTAL SYSTEM OPERATING ENERGY
TOTAL ENERGY CONSUMED

	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
COLLECTED SOLAR ENERGY	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
AVERAGE AMBIENT TEMPERATURE	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
AVERAGE BUILDING TEMPERATURE	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
ECSS SOLAR CONVERSION EFFICIENCY	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
ECSS OPERATING ENERGY	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
TOTAL SYSTEM OPERATING ENERGY	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F
TOTAL ENERGY CONSUMED	2.372 MILLION BTU	52721 BTU/SQ.FT*	1.410 MILLION BTU	31332 BTU/SQ.FT*	67 DEGREES F	N.A. DEGREES F

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	1.100	N.A.	N.A.	1.106 MILLION BTU
SOLAR FRACTION	77	N.A.	N.A.	77 PERCENT
SOLAR ENERGY USED	0.869	N.A.	N.A.	0.869 MILLION BTU
OPERATING ENERGY	N.A.	N.A.	N.A.	0.189 MILLION BTU
AUX. THERMAL ENERGY	0.259	N.A.	N.A.	0.259 MILLION BTU
AUX. ELECTRIC FUEL	N.A.	N.A.	N.A.	N.A. MILLION BTU
AUX. FOSSIL FUEL	0.432	N.A.	N.A.	0.432 MILLION BTU
ELECTRICAL SAVINGS	N.A.	N.A.	N.A.	-0.189 MILLION BTU
FOSSIL SAVINGS	1.448	N.A.	N.A.	1.448 MILLION BTU

SYSTEM PERFORMANCE FACTOR:

* DENOTES UNAVAILABLE DATA

@ DENOTES NULL DATA

N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT
OF THE NATIONAL SOLAR DATA PROGRAM, FEBRUARY 28, 1978.
SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: SADDLE HILLS TRUST LOT #73 • MEDWAY, MA 02053
REPORT PERIOD: JUNE 1979

SITE/SYSTEM DESCRIPTION:

THE SADDLE HILL TRUST • LOT #73 SOLAR ENERGY SYSTEM FURNISHES HOT WATER YEAR-ROUND TO A SINGLE FAMILY DWELLING. THE COLLECTOR IS A TWO-PANEL LIQUID COLLECTOR. STORAGE SPACE IS AN 80 GALLON WATER TANK. AUXILIARY HOT WATER IS PROVIDED BY A GAS HOT WATER HEATER.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY

COLLECTED SOLAR ENERGY

AVERAGE AMBIENT TEMPERATURE
AVERAGE BUILDING TEMPERATURE
ECSS SOLAR CONVERSION EFFICIENCY
ECSS OPERATING ENERGY
TOTAL SYSTEM OPERATING ENERGY
TOTAL ENERGY CONSUMED

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	1.167	N.o.A.	N.o.A.	1.167 GIGA JOULES
SOLAR FRACTION	77	N.o.A.	N.o.A.	77 PERCENT
SOLAR ENERGY USED	0.917	N.o.A.	N.o.A.	0.917 GIGA JOULES
OPERATING ENERGY	N.o.A.	N.o.A.	N.o.A.	0.199 GIGA JOULES
AUX. THERMAL ENG	0.273	N.o.A.	N.o.A.	0.273 GIGA JOULES
AUX. ELECTRIC FUEL	N.o.A.	N.o.A.	N.o.A.	N.o.A. GIGA JOULES
AUX. FOSSIL FUEL	0.456	N.o.A.	N.o.A.	0.456 GIGA JOULES
ELECTRICAL SAVINGS	N.o.A.	N.o.A.	N.o.A.	-0.199 GIGA JOULES
FOSSIL SAVINGS	1.528	N.o.A.	N.o.A.	1.528 GIGA JOULES

SYSTEM PERFORMANCE FACTOR:

* DENOTES UNAVAILABLE DATA

□ DENOTES NULL DATA

N.o.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT
OF THE NATIONAL SOLAR DATA PROGRAM, FEBRUARY 26, 1978.
SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENERGY COLLECTION AND STORAGE SUBSYSTEM (ECSS)SITE: SADDLE HILLS TRUST LOT #73 • MEDWAY, MA 02053
REPORT PERIOD: JUNE, 1979

SOLAR/1039-79/06

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	AMBIENT TEMP DEG-F	ENERGY TO LOADS MILLION BTU	AUX THERMAL TO ECSS MILLION BTU	ECSS OPERATING ENERGY MILLION BTU	ECSS ENERGY REJECTED MILLION BTU	ECSS SOLAR CONVERSION EFFICIENCY
1	0.071	63	0.038	N	0.007	N	0.531
2	0.067	64	0.032	0	0.007	0	0.471
3	0.037	66	0.016	T	0.007	T	0.426
4	0.027	63	0.018	A	0.006	A	0.662
5	0.050	63	0.010	P	0.006	P	0.190
6	0.097	66	0.040	P	0.007	P	0.417
7	0.092	66	0.032	P	0.007	P	0.344
8	0.037	66	0.025	LL	0.007	LL	0.673
9	0.067	74	0.038	II	0.007	II	0.565
10	0.084	71	0.013	C	0.006	C	0.152
11	0.092	71	0.034	A	0.006	A	0.372
12	0.110	61	0.035	BB	0.007	BB	0.321
13	0.090	61	0.038	EE	0.006	EE	0.425
14	0.104	67	0.045	EE	0.007	EE	0.430
15	*	*	*	*	*	*	*
16	0.066	80	0.032	CC	0.005	CC	0.483
17	0.087	78	0.024	EE	0.007	EE	0.276
18	0.057	78	0.027	EE	0.005	EE	0.479
19	0.098	63	0.043	EE	0.006	EE	0.442
20	0.107	66	0.026	EE	0.007	EE	0.247
21	0.099	62	0.033	EE	0.006	EE	0.330
22	0.065	69	0.031	EE	0.006	EE	0.350
23	0.082	73	0.024	EE	0.007	EE	0.286
24	0.085	67	0.004	EE	0.006	EE	0.043
25	0.088	60	0.034	EE	0.006	EE	0.383
26	0.098	64	0.043	EE	0.006	EE	0.433
27	0.091	64	0.027	EE	0.006	EE	0.294
28	0.076	69	0.029	EE	0.007	EE	0.362
29	0.080	68	0.031	EE	0.006	EE	0.364
30	0.069	68	0.022	EE	0.007	EE	0.319
SUM	2.0372	-	0.864	N.A.	0.189	N.A.	-
AVG	0.079	67	0.029	N.A.	0.006	N.A.	0.366
NBS ID	Q01	N113			Q102		N111

* DENOTES UNAVAILABLE DATA.

@ DENOTES NULL DATA.

N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MUNTHLY REPORT SUTTEUR & KAY PERFORMANCE

SITE: SADDLE HILLS TRUST LOT #73 • MEDWAY, MA 02055 SOLAR / 1039-79/66
REPORT PERIOD: JUNE 1978

		COLLECTOR ARRAY EFFICIENCY		DAYTIME AMBIENT TEMP DEG F			
		COLLECTED SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU
1	0.071	0.006	0.006	0.043	0.043	0.613	0.613
2	0.067	0.061	0.061	0.043	0.043	0.644	0.644
3	0.037	0.034	0.034	0.023	0.023	0.615	0.615
4	0.027	0.024	0.024	0.015	0.015	0.560	0.560
5	0.050	0.048	0.048	0.032	0.032	0.647	0.647
6	0.097	0.092	0.092	0.060	0.060	0.617	0.617
7	0.092	0.056	0.056	0.057	0.057	0.623	0.623
8	0.037	0.034	0.034	0.022	0.022	0.592	0.592
9	0.067	0.063	0.063	0.040	0.040	0.595	0.595
10	0.084	0.079	0.079	0.055	0.055	0.654	0.654
11	0.092	0.085	0.085	0.052	0.052	0.563	0.563
12	0.110	0.103	0.103	0.065	0.065	0.594	0.594
13	0.090	0.082	0.082	0.046	0.046	0.511	0.511
14	0.104	0.097	0.097	0.066	0.066	0.636	0.636
15	*	*	*	*	*	*	*
16	0.066	0.061	0.061	0.045	0.045	0.684	0.684
17	0.087	0.082	0.082	0.049	0.049	0.563	0.563
18	0.057	0.051	0.051	0.032	0.032	0.565	0.565
19	0.098	0.092	0.092	0.053	0.053	0.541	0.541
20	0.107	0.099	0.099	0.068	0.068	0.641	0.641
21	0.099	0.091	0.091	0.056	0.056	0.564	0.564
22	0.088	0.081	0.081	0.055	0.055	0.624	0.624
23	0.082	0.078	0.078	0.046	0.046	0.556	0.556
24	0.065	0.078	0.078	0.042	0.042	0.491	0.491
25	0.088	0.081	0.081	0.049	0.049	0.560	0.560
26	0.098	0.090	0.090	0.056	0.056	0.567	0.567
27	0.091	0.083	0.083	0.054	0.054	0.591	0.591
28	0.076	0.072	0.072	0.043	0.043	0.562	0.562
29	0.080	0.074	0.074	0.051	0.051	0.642	0.642
30	0.069	0.066	0.066	0.046	0.046	0.664	0.664
SUM	2.372	2.207	2.207	1.410	1.410	-	-
Avg	0.079	0.074	0.074	0.047	0.047	0.594	0.594
NBSID	QU01			Q100	Q100	N100	N100

* DENOTES UNAVAILABLE DATA

SERIES NOTES DENOTES DATA

2. VENUES NULL DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
STORAGE PERFORMANCESITE: SADDLE HILLS TRUST LOT #73 • MEJAWAY, MA 02055 SOLAR / 1039-79/06
RTPUKI PERIOD: JUNE • 1975

DAY OF MONTH	ENERGY TO STORAGE MILLION BTU	ENERGY FROM STORAGE MILLION BTU	CHANGE IN STORED ENERGY MILLION BTU	STORAGE AVERAGE TEMP DEG F	STORAGE EFFICIENCY
					STORAGE PERFORMANCE
1	0.042	0.038	-0.007	89	0.732
2	0.041	0.032	-0.002	82	0.738
3	0.024	0.016	0.002	78	0.755
4	0.014	0.018	-0.005	74	0.970
5	0.031	0.010	0.014	63	0.775
6	0.056	0.040	-0.016	101	0.669
7	0.053	0.032	0.005	100	0.697
8	0.022	0.025	-0.003	88	0.760
9	0.037	0.038	-0.010	94	0.750
10	0.051	0.013	0.028	97	0.793
11	0.047	0.034	-0.004	114	0.634
12	0.059	0.035	0.005	107	0.677
13	0.039	0.038	-0.012	117	0.665
14	0.062	0.045	0.004	99	0.793
15	*	*	*	*	*
16	0.043	0.032	0.023	104	1.285
17	0.046	0.024	0.006	124	0.661
18	0.030	0.027	-0.012	123	0.507
19	0.047	0.043	-0.013	114	0.639
20	0.063	0.026	0.020	106	0.738
21	0.051	0.033	-0.001	121	0.627
22	0.050	0.031	0.003	119	0.667
23	0.039	0.024	-0.004	126	0.502
24	0.034	0.004	0.015	132	0.541
25	0.043	0.034	-0.007	121	0.618
26	0.048	0.043	-0.018	125	0.510
27	0.048	0.027	0.006	111	0.664
28	0.037	0.029	-0.006	112	0.611
29	0.047	0.031	0.001	102	0.688
30	0.042	0.022	0.007	98	0.700
SUM	1.290	0.869	0.031	-	-
Avg	0.043	0.029	0.001	106	0.698
NBS ID	Q200	Q201	Q202	N106	

* DENOTES UNAVAILABLE DATA.

@ DENOTES NULL DATA.

J.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
HOT WATER SUBSYSTEMSITE: SADDLE HILLS TRUST LWT #73 • MEDWAY, MA 02053
REPORT PERIOD: JUNE, 1979

SOLAR/1039-79/06

DAY OF MON.	HOT WATER LOAD MILLION BTU	SOLAR FR. OF LOAD PER CENT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU		SUP. WAT. TEMP. DEG F	HOT WATER USED GAL
									HOT WAT. TEMP. DEG F	WAT. TEMP. DEG F		
1	0.062	59	0.038	N	0.031	N	0.051	N	0.063	56	133	108
2	0.076	45	0.032	O	0.049	O	0.082	O	0.053	59	131	124
3	0.052	34	0.016	T	0.042	T	0.070	T	0.026	59	135	83
4	0.070	27	0.016	A	0.055	A	0.092	A	0.030	59	136	108
5	0.030	24	0.010	P	0.024	P	0.040	P	0.016	61	131	51
6	0.047	58	0.040	P	0.005	P	0.008	P	0.067	60	129	83
7	0.036	81	0.032	P	0.006	P	0.011	P	0.053	59	126	66
8	0.042	77	0.025	L	0.020	L	0.033	L	0.041	61	130	76
9	0.050	67	0.038	L	0.009	L	0.016	L	0.063	60	127	92
10	0.019	66	0.013	C	0.009	C	0.015	C	0.021	60	123	36
11	0.033	87	0.034	C	0.000	C	0.000	C	0.057	61	126	60
12	0.038	95	0.035	A	0.000	A	0.000	A	0.059	62	124	71
13	0.035	99	0.038	B	0.000	B	0.000	B	0.064	62	123	64
14	0.048	100	0.045	E	0.000	E	0.000	E	0.074	61	123	98
15	*	*	*	*	*	*	*	*	*	*	*	*
16	0.038	100	0.032	O	0.000	O	0.000	O	0.053	63	117	80
17	0.022	100	0.024	O	0.000	O	0.000	O	0.040	65	119	46
18	0.027	100	0.027	O	0.000	O	0.000	O	0.045	62	125	51
19	0.040	100	0.043	O	0.000	O	0.000	O	0.072	64	127	73
20	0.033	100	0.026	O	0.000	O	0.000	O	0.044	63	120	66
21	0.030	100	0.033	O	0.000	O	0.000	O	0.055	64	119	63
22	0.032	100	0.031	O	0.000	O	0.000	O	0.051	63	125	61
23	0.021	100	0.024	O	0.000	O	0.000	O	0.039	63	125	40
24	0.003	100	0.004	O	0.000	O	0.000	O	0.006	63	128	6
25	0.031	100	0.034	O	0.000	O	0.000	O	0.056	63	130	55
26	0.038	100	0.043	O	0.000	O	0.000	O	0.071	64	127	72
27	0.027	100	0.027	O	0.000	O	0.000	O	0.045	63	129	50
28	0.028	100	0.029	O	0.000	O	0.000	O	0.048	64	125	54
29	0.037	100	0.031	O	0.000	O	0.000	O	0.051	63	117	81
30	0.024	100	0.022	O	0.000	O	0.000	O	0.037	63	113	57
SUM	1.106	-	0.869	N.A.	0.259	N.A.	0.432	N.A.	1.446	-	-	2041
AVG	0.037	77	0.029	N.A.	0.009	N.A.	0.014	N.A.	0.048	62	126	68
NBS	Q302	N300	Q300	Q303	Q301	Q305	Q305	Q306	Q313	N307	N308	

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.

N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENVIRONMENTAL SUMMARYSITE: SAUOLE HILLS TRUST LOT #73 • MIDDAY • MA 02053
REPORT PERIOD: JUNE • 1974

SOLAR/1039-79/06

NBS ID	DAY OF MONTH	TOTAL INSOLATION BTU/SQ.FT	DIFFUSE INSOLATION BTU/SQ.FT	AMBIENT TEMPERATURE DEG F	RELATIVE HUMIDITY PERCENT	WIND DIRECTION DEGREES	WIND SPEED M.P.H.	WIND DIRECTION	
								DEGREES	M.P.H.
	1	1574	N	63	72	N	N	-	-
	2	1486	O	64	77	O	O	-	-
	3	621	T	66	73	T	T	-	-
	4	603	A	63	69	A	A	-	-
	5	1117	P	63	69	P	P	-	-
	6	2147	P	68	82	P	P	-	-
	7	2046	P	66	81	L	L	-	-
	8	612	L	66	74	I	I	-	-
	9	1488	I	74	*	C	C	-	-
	10	1656	C	71	81	A	A	-	-
	11	2642	A	71	71	A	A	-	-
	12	2443	B	61	71	B	B	-	-
	13	1997	L	61	71	L	L	-	-
	14	2304	E	67	62	E	E	-	-
	15	*	*	*	*	*	*	-	-
	16	1457	60	58	58	58	58	-	-
	17	1926	76	78	96	96	96	-	-
	18	1264	78	73	71	71	71	-	-
	19	2179	63	66	79	79	79	-	-
	20	2367	66	62	76	76	76	-	-
	21	2209	62	69	85	85	85	-	-
	22	1957	69	73	74	74	74	-	-
	23	1625	67	73	79	79	79	-	-
	24	1685	67	60	72	72	72	-	-
	25	1947	60	64	80	80	80	-	-
	26	2185	64	64	78	78	78	-	-
	27	2026	64	69	83	83	83	-	-
	28	1987	69	62	62	62	62	-	-
	29	1775	68	68	*	*	*	-	-
	30	1539	-	-	-	-	-	-	-
	SUM	52721	N.A.	-	-	-	-	-	-
	AVG	1757	N.A.	67	76	N.A.	N.A.	N.A.	N.A.
	NBS ID	Q001		N113		N115		N114	

* DENOTES UNAVAILABLE DATA.

@ DENOTES NULL DATA.

N.A. DENOTES NOT APPLICABLE DATA.



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